

## REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim 1 has been amended to recite that the curing is conducted at a temperature of 60-70°C for 10-25 minutes. Claim 19 has been amended to recite that the curing is conducted at a temperature of 65-70°C for 15-20 minutes. Support for these amendments is found on page 16, lines 17-19 of Applicants' specification.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

The rejection of claims 1, 3-13 and 16-19 under 35 U.S.C. § 103(a) as being unpatentable over Rink et al. in view of Marutani et al. and Ido et al. is respectfully traversed.

The Examiner relies on Rink and Marutani et al. for the reasons set forth previously. The Examiner admits that while Rink teaches that the substrate may be a plastic automotive substrate, neither Rink nor Marutani et al. explicitly teach that the substrates are ABS or PC components. The Examiner states that Ido et al. teach that examples of plastic automotive components that may be coated with multi-layer coating films include ABS plastics. The Examiner takes the position that it would have been obvious to one of ordinary skill in the art to utilize, as the plastic substrate, an ABS resin plastic substrate.

However, as discussed above, Applicants have amended claim 1 to require the curing step to occur at a temperature of 60-70°C for 10-25 minutes.

With respect to automotive production line, the following is stated in the "Background Art" section of Applicants' specification:

...[D]ue to energy saving in painting line by low-temperature, short-time baking and productivity improvement by increased conveyor speed, recently the baking conditions (temperature-time) of rigid resin parts have changed to 60-70°C – 10-25 minutes, preferably 65-70°C – 15-20 minutes, from conventional 80-90°C – 40-60 minutes. Hence, development of clear paint which can form paint film showing good tack property (i.e., free of tackiness and

does not retain fingerprints of persons who touch the film) after being baked under such conditions and left standing at room temperature and excelling in finish performance, film performance and paint stability is in demand. (Emphasis added.)

(See page 1, lines 22-32 of Applicants' specification.)

Applicants' recited method has been developed to meet the above-mentioned demand, and has succeeded in satisfying the demand. Specifically, in Applicants' invention, as a base resin component for clear paint, there is chosen and used a particular hydroxyl-containing acrylic resin (A):

- (i) having hydroxyl value of 80-160 mgKOH/g, and
- (ii) being prepared by radical-copolymerizing:
  - (a) 8-30% by weight of a primary hydroxyl-containing monomer selected from the group consisting of 4-hydroxybutyl (meth)acrylate monomers and  $\epsilon$ -caprolactone-modified vinyl monomers obtained by ring-opening polymerization of  $\epsilon$ -caprolactone with hydroxyalkyl(meth)acrylate;
  - (b) 10-40% by weight of secondary hydroxyl-containing monomer; and
  - (c) 30-82% by weight of still other polymerizable unsaturated monomer,

and the clear paint further contains a specific amount (1-20% by weight) of hydroxyl-containing oligomer (C) which is a reaction product of a carboxyl-containing compound with an epoxy-containing compound.

In actual automotive body painting on the production line, using a belt conveyor which runs at a constant speed, the baking condition for painted rigid resin parts of automotive body is usually set at 60-70°C/10-25 minutes. It is required that, even though workers on the line handle the painted parts with hand, fingerprints should not be left (tackiness should be excellent). It would, however, have been quite difficult even for a skilled person in the art to develop a clear paint which would meet this requirement.

The clear paint as used in Applicants' claimed method is fully cured by baking at a low temperature (60-70°C) for a short time (10-25 minutes), and thus

completely satisfies the above-mentioned requirement. According to Applicants' invention, the clear paint unexpectedly results in reduction in energy consumption by painting line or productivity improvement by increased conveyor running speed.

Paint film of clear paint which is usually employed decreases in thermoflowability when baked at a low temperature; resulting in decrease of smoothness and adherability of the paint film. Applicants' invention has overcome this defect by blending a specific amount of oligomer (C) with clear paint.

Neither Rink et al. nor Marutani et al. teach or suggest the above-mentioned idea or the technical advantages of the Applicants' application.

Rink et al. only disclose "60°C for 30 min." with regard to baking condition for clear coating. (See column 13, line 64 of the reference.) Rink et al. fail to teach or suggest 60-70°C for 10-25 minutes, as required by Applicants' amended Claim 1.

Marutani et al. disclose a baking condition of 60-200°C, preferably 80-160°C/1-60 min. preferably 10-40 min. (See column 17, lines 12-13 of the reference.) In the working examples of the reference, however, only a condition of 150°C/30 min. is used. (See column 56, lines 58-59 of the reference.) Thus, Marutani et al. fail to teach or suggest the use of a low temperature/short time baking condition (60-70°C/10-25 min.). as required by Applicants' amended claims.

Therefore, neither Marutani et al. nor Rink et al. teach or suggest a clear paint which would be cured completely by low temperature/short time baking, as required of actual production line for the painting of rigid resin parts of automotive body.

With respect to Ido et al., the Examiner states, "Ido teaches that examples of plastic automotive components that may be coated with multi-layer coating films include ABS plastics [0004]." Ido et al., however, teach or suggest nothing about the aforementioned idea and technical advantages of the present invention.

With regard to the baking condition, only "80°C x 30 min" is seen in Ido et al. (See page 6, paragraph [0097] of the reference.) Ido et al. fail to teach or

suggest the condition of 60-70°C for 10-25 minutes, as required by Applicants' amended claims. Therefore, Ido et al. fail to remedy the above-discussed deficiencies of Rink in view of Marutani et al.

For these reasons, the invention of claims 1-3, 3-13 and 16-19 is clearly patentable over the cited combination of references.

The rejection of claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Rink et al., Marutani et al., and Ido et al., and further in view of Asahina et al. and Croft is respectfully traversed.

As discussed above, the combination of Rink et al. and Marutani et al. and Ido et al. do not teach the clear paint composition recited in Applicants' amended claim 1. Neither Asahina et al. nor Croft remedy the deficiencies of Rink et al. in view of Marutani et al. and Ido et al. Therefore, since claim 2 is directly dependent on claim 1, the subject matter of claim 2 is patentable over Rink et al. in view of Marutani et al. and Ido et al. for the same reasons that the subject matter of claim 1 is patentable over this combination of references.

For these reasons, the invention of claim 2 is clearly patentable over Rink et al. in view of Marutani et al. and Ido et al. and further in view of Asahina et al. and Croft.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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